

### CLAIMS

1. Process for manufacturing nanowire structures, characterised in that it comprises:
  - manufacture of a thin semiconductor film (1) extending between a first terminal (4) and a second terminal (5), and
  - passage of a current between the first and the second terminals so as to form at least one continuous overthickness (R1, R2, R3) in the thin semiconductor film by migration of a fraction of the semiconductor material under the action of the current, the continuous overthickness being formed along the direction of the current that passes through the film.
2. Process according to claim 1, characterised in that the thin semiconductor film is obtained by lithography and/or etching of a thin semiconductor layer formed on an insulating layer.
3. Process according to either claim 1 or 2, characterised in that said thin film is etched to form a set of nanowires (F1, F2, F3) after the formation of the linear overthickness due to passage of a current in the thin semiconductor film.
4. Process according to any one of the above claims, characterised in that the thin semiconductor film is a thin film of Si, SiGe or SiGeC.

5. Process according to any one of the above claims, characterised in that the semiconductor is doped.

6. Process according to any one of the above claims, characterised in that the semiconductor is monocrystalline.

7. Process for etching a layer using a hard mask, characterised in that the hard mask used is a nanowire structure obtained by a manufacturing process according to any one of claims 1 to 6.